

- Adolescence
- Puberty
- Growth

Take good care

Human babies need a lot more care from their parents than other newborn mammals. They cannot feed themselves or walk when they are born. But baby zebras and giraffes can run around soon after they are born. Unlike humans, they need to do this to avoid being eaten by other animals. Humans look after their young until they are aged 18, so they have a good chance of surviving!

All change!

You are all at the **adolescence** stage. Adolescence is a time in everyone's life when physical and emotional changes happen. The changes prepare us to be young adults. The changes happen at different times in different people.

Adolescence finishes when people stop growing, at about the age of 18 years.

a What happens in adolescence?

During puberty


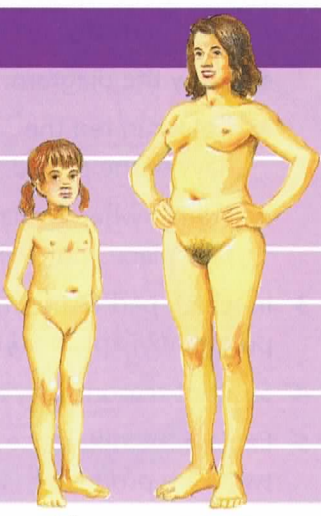
Puberty is the first part of adolescence. It is a time of great change for boys and girls. It is when most of the physical changes happen that make it possible to have babies. Substances called hormones bring about these changes. The testes in boys make the hormone **testosterone**. The ovaries in girls make the hormone **oestrogen**.

b What are hormones?

Puberty usually starts earlier in girls than it does in boys. In puberty, young people often find that their emotions and behaviour change. They become more attracted to the opposite sex.

The changes that happen at puberty are listed in the table. Some are also shown in the pictures below.



Changes in boys	Changes in girls
sudden increase in height (growth spurt)	sudden increase in height (growth spurt)
hair starts to grow on body, including pubic hair	hair starts to grow on body, including pubic hair
voice deepens	breasts grow
testes start to make sperm and hormones	ovaries start to release eggs and make hormones
shoulders broaden	hips widen
sexual organs get bigger	periods start
 boy → man	 girl → woman

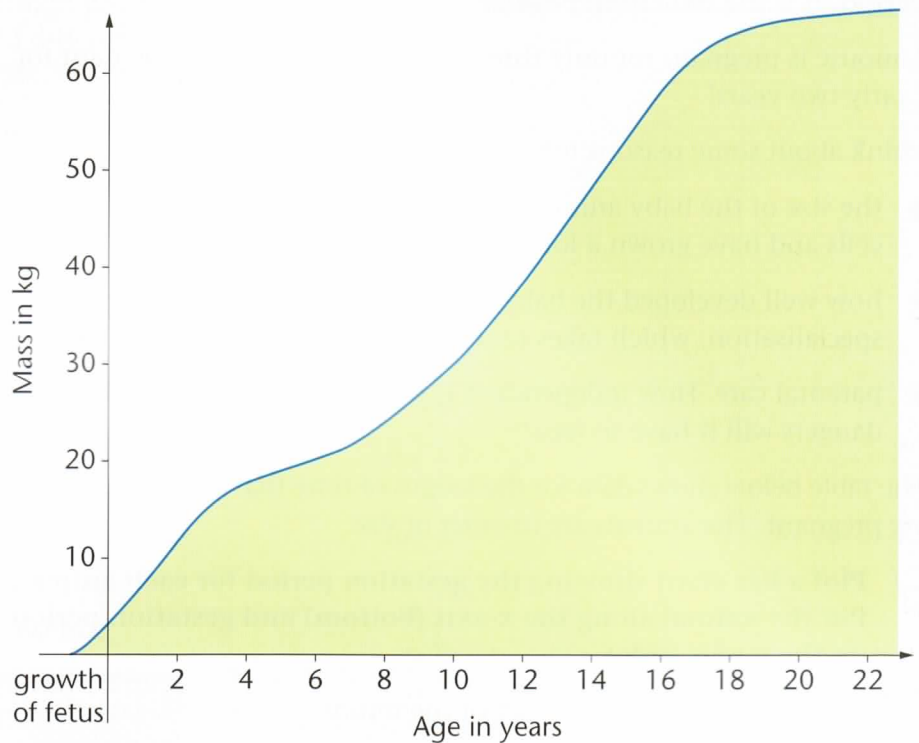
Size matters

When a person grows, their cells split into two. This continues to produce more cells. The process is called cell division. At first there is no increase in mass because a big cell divides into lots of smaller new cells. Then the cells increase in size, so the mass increases. This is **growth**.

Growth spurts

A growth spurt is a time of rapid growth. It happens when cells divide rapidly and get bigger. The fetus has a growth spurt. Adolescence is another time when we have a growth spurt.

We can investigate growth by measuring the increase in height or mass of someone. A graph of human growth based on increase in mass would look like this one:



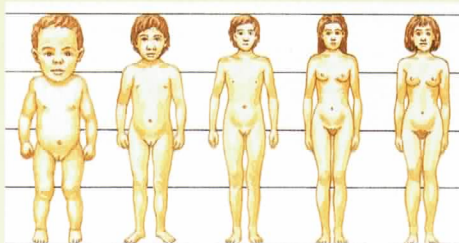
- C** (i) How many growth spurts are there?
 (ii) At what ages do they happen?
 (iii) When do we stop growing?

Questions

- a** What two types of changes happen in adolescence?

b What is the first part of adolescence called?
- a** Describe three changes that happen to boys during puberty.

b Describe three changes that happen to girls during puberty.
- What are the hormones called that cause the changes in puberty in boys and girls?
- The different parts of the human body do not all grow at the same rate from babyhood to adulthood. Which part do you think is bigger during babyhood. Suggest a reason for this.
- Think about each of the following stages of the human life cycle:
babyhood childhood adolescence puberty adulthood



Draw a table to summarise the physical changes that take place at each stage.

For your notes:

- Adolescence** is a time when physical and emotional changes happen.
- Puberty** is the first part of adolescence when most of the physical changes happen.
- The testes in boys make the hormone **testosterone**. The ovaries in girls make the hormone **oestrogen**.
- Growth** happens when cells divide and increase in size.